

Appl. No. 09/575,122
Amdt. Dated March 08, 2005
Response to Office Action of February 17, 2005

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for up-interpolating a Bayer mosaic image from input space to output space, said Bayer mosaic image input space comprising a plurality of four-pixel blocks, each pixel in said blocks being one of three different colors with ~~one of two~~ of said four pixels in each block being a dominant color and the other two of said four pixels being non-dominant colors, said method including the steps of:
reading a two dimensional color plane of said Bayer image for each said color;
mapping said pixels of said dominant color from said input space to said output space by:
multiplying each coordinate of said input space by $1/\sqrt{2}$; and
scaling coordinates of said input space to a normalized coefficient kernel by
multiplying said coordinates by $1/\sqrt{2}$;
mapping said pixels of said non-dominant colors by multiplying each ordinate coordinate — of said input space by $1/2$;
for each color, convolving said input space pixels with a coefficient kernel for each color; and
writing said all mapped pixels to a storage location.
2. (Original) The method of claim 1 wherein said three different colors are red, green and blue.
3. (Original) The method of claim 1 or 2 wherein said dominant color is green.
4. (Original) The method of claim 1 wherein said coefficient kernel is the same for said two non-dominant colors but different for said dominant color.
5. (Currently amended) The method of claim 1 wherein, ~~for said dominant color~~, said mapping step for said dominant color further includes sampling a 4x4 pixel block.
6. (Currently amended) An apparatus for up-interpolating a Bayer mosaic image from input space pixel values to output space pixel values, said Bayer mosaic image comprising a plurality of four-pixel blocks, each pixel in said blocks being one of three different colors with ~~one of two~~ of said four pixels in each block being a dominant color and the other two of said four pixels being non-dominant colors, said apparatus comprising:
an input buffer for each color for storing said input space pixel values;

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a coefficient kernel for each color, said coefficient kernel for said dominant color being normalized;

processing means configured for:

mapping said pixels of said dominant color from said input space to said output space by multiplying each coordinate of said input space by $1/\sqrt{2}$;

scaling coordinates of said input space to a normalized coefficient kernel by multiplying said coordinates by $1/\sqrt{2}$; and

mapping said pixels of said non-dominant colors by multiplying each coordinate of said input space by $1/2$;

a convolve unit for each color for convolving said input space pixel values with said kernel coefficients of each color; and

an output buffer for storing mapped pixel values.

7. (Original)The apparatus of claim 6 further comprising processing means for sampling a 4x4 pixel block for said dominant color.
8. (Currently amended)A method of interpolating a Bayer image of red, green and blue pixels from an input space to an output space, the method including the steps of: receiving the Bayer image; and mapping each of the input space colors to the output space in accordance with the following equations:

$$x'=(x/ops)+k_1$$

$$y'=(y/ops)+k_2$$

where x,y is a coordinate in the output space, x'y' is the coordinate in the input space, ops is the number of pixels in the output space per input space sample, and $k_{1,2}$ are either 0 or -0.5 depending on the color and the a desired relative rotational orientation of the image.

9. (Currently amended)The method of claim 8 wherein, for the green pixels in the input space, each ~~ordinate~~coordinate of the input space is multiplied by $1/\sqrt{2}$.
10. (Original)The method of claim 8 wherein, for the green pixels in the input space, each coordinate of the input space is multiplied by $1/\sqrt{2}$.
11. (Currently amended)A method of sampling a Bayer image having two dimensional planes of red, green and blue pixels, the method including the steps of: rotating the green plane by 45° ; sequentially sampling an m x m pixel block of the rotated plane, where m is an integer greater than 1;

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- providing ~~an~~ addresses for the m^2 samples by determining a starting address for a first of the samples and thereafter applying a predetermined fixed sequence of ~~offsets~~ to obtain the addresses of the remaining samples.
12. (Currently amended) The method of claim 11 wherein the step of determining the starting address is responsive to the ~~a~~ relative rotational orientation of the image.
13. (Original) The method of claim 11 wherein $m=4$ and there are sixteen offsets.
14. (Currently amended) An apparatus for sampling a Bayer image having two dimensional planes of red, green and blue pixels, the apparatus comprising:
input means for rotating the green plane by 45° ;
processing means for sequentially sampling an $m \times m$ pixel block of the rotated plane, where m is an integer greater than 1;
address means for providing ~~an~~ addresses for the m^2 samples by determining a starting address for a first of the samples and thereafter applying a predetermined fixed sequence of offsets to obtain the addresses of the remaining samples.

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